CAROLINA WATER SERVICE, INC.
Docket No. 2000-0207-W/S

DIRECT TESTIMONY
OF
JAMES E. SPEARMAN

RESEARCH DEPARTMENT

PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA

JUNE 27, 2001

1   **Q   Please state for the record your name, business address and position**

2   **with the Public Service Commission of South Carolina.**

3   **A**   My name is James E. Spearman. My business address is 101 Executive

4   Center Drive, Columbia, SC. I am employed by the Public Service Commission

5   of South Carolina as Research & Planning Administrator.

6   **Q   Please summarize your educational background and professional**

7   **experience.**

8   **A**   I graduated from Pennsylvania State University with a Bachelor of

9   Science in Mineral Economics and from the Darden School of the University of

10 Virginia with a Master of Business Administration. I received a Doctor of

11 Philosophy in Resource Economics from West Virginia University with

12 specialization areas in Regional Economics and Trade and Development.

13   My professional experience includes being a faculty member at the

14 University of South Carolina-Lancaster and Erskine College where I taught a

15 variety of economics and business courses. I also taught economics courses as

16 an adjunct professor in the Graduate Business Program of Morehead State

17 University. My experience also includes employment as an Economist at the

18 Federal Highway Administration, as a consultant at Foster Associates, Inc., and

19 as a Senior Economist at Ashland Inc. I joined the Research Department of the

20 Public Service Commission in October of 1990.

21 **Q   What is the purpose of your testimony?**

22 **A**   The purpose of my testimony is to determine the cost of equity or

23 return-on-equity appropriate for Utilities, Inc., the parent company of Carolina

1   Water Service, Inc. (CWS). I will also determine the overall cost of capital for

2   Utilities, Inc. based on its cost of debt and my estimate of its appropriate cost

3   of equity.

4 **Q   What methodology was used to develop an estimate of Utilities,**

5 **Inc.'s cost of capital?**

6 **A**   Three components are necessary to estimate the cost of capital: the

7   capital structure, the cost of equity or return-on-equity, and the cost of debt.

8   Utilities, Inc. provided its cost of debt which was verified by the Audit

9   Department of the Public Service Commission. The Discounted Cash Flow

10   Model (DCF), the Capital Asset Pricing Model (CAPM), and Risk Premium

11   analyses were used to estimate the cost of equity or return-on-equity

12   appropriate for Utilities, Inc. and CWS. The appropriate capital structure was

13   determined through analyses of Utilities, Inc.'s capital structure and the capital

14   structures of a sample group of water and wastewater companies.

15 **Q   How did you estimate the cost of equity or return-on-equity for**

16 **Utilities, Inc.?**

17 **A**   As previously stated, I applied the DCF, CAPM, and Risk Premium

18   analyses. Each of these methods is widely used and accepted in rate-making

19   proceedings as conforming to the requirements of the Hope and Bluefield

20   cases and is well documented in finance literature. Because neither Utilities,

21   Inc. nor CWS are publicly traded, I applied the DCF and CAPM to a group of

22   water and wastewater companies for comparison purposes.

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1   **Q   Which companies did you select for comparison, and how do they**

2   **compare to Utilities, Inc. and Carolina Water Service?**

3   **A**   The companies I selected for comparison purposes are American

4   States Water Company, American Water Works Company, California Water

5   Service Group, and Philadelphia Suburban Corporation. American States Water

6   Company is a holding company that, through subsidiaries, provides water

7   service to 1 out of 30 Californians located within 75 communities through out

8   10 counties in California and 11,100 customers in Arizona. It also distributes

9   electricity to about 22,000 customers in California. American Water Works is

10   the nation's largest and most geographically diverse publicly-traded utility

11   devoted exclusively to water and wastewater businesses. Its subsidiaries serve

12   more than 10 million people in 1,300 communities in 23 states from coast-to-

13   coast. Through its subsidiaries, California Water Service Group provides

14   regulated and non-regulated water service to more than 2 million people in 96

15   California, Washington, and New Mexico communities. Philadelphia Suburban

16   Corp. is a holding company for regulated public utilities that provide water and

17   wastewater services to approximately 2 million residents in Pennsylvania,

18   Ohio, Illinois, New Jersey, Maine, and North Carolina. These four companies

19   are the only publicly traded water and wastewater companies included in the

20   Value Line Investment Survey.

21   Utilities, Inc. is a holding company that owns and operates 397 water

22   and wastewater utility systems through 76 subsidiary operating companies. It

23   serves about 235,000 customers in Florida, North Carolina, South Carolina,

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1   Illinois, and Louisiana. The non-utility operations of Utilities, Inc. consist of a

2   solid waste collection billing service and management services. In South

3   Carolina CWS provides water service to approximately 6,200 customers and

4   wastewater service to over 11,000 customers.

5   Exhibit(JES-1) shows financial data for the comparison companies,

6   Utilities, Inc., and CWS for the year 2000. Average operating revenues for the

7   comparison companies are nearly $514 million. Operating revenues are

8   approximately $65 million for Utilities, Inc., and $5 million for CWS. Average

9   net income for the comparison companies is $62 million compared to $10

10   million for Utilities, Inc., and $300,000 for CWS. The average net utility plant

11   for the comparison companies is $1,886 million. Net utility plant for Utilities,

12   Inc. is $352 million and $28 million for CWS. Utilities, Inc.'s earnings per share

13   of $1.58 exceeds the group average of $1.48. The comparison companies pay

14   approximately 67% of their earnings in dividends while Utilities, Inc. and CWS

15   pay no dividends. The 14.4% return-on-equity for Utilities, Inc. exceeds the

16   10.4% average return-on-equity for the comparison companies and for each

17   company. The 2.8% return-on-equity of CWS is substantially below the return-

18   on-equity of any company in the comparison group.

19   **Q**   **Based on the Discounted Cash Flow (DCF) method, what is your**

20   **estimate of the cost of equity for Utilities, Inc. or CWS?**

21   **A**   The DCF methodology requires two components, a dividend yield and

22   an expected growth rate. For investors as a whole, the market value of

23   common stock is equal to the present value of the expected stream of future

1   dividends. Therefore, one must know the current dividend yield and its

2   expected growth in order to utilize the basic annual DCF model:

3    $$R_e = (D_1/P_o) + G$$

4   Where R_e = return on equity

5   D_1 = next annual dividend

6   P_0 = current market price of common stock

7   G = growth rate.

8   Assuming the market is efficient, the current dividend yield should

9   reflect the best judgment of investors concerning the value of a stock. In

10   essence, this assumption means that the current dividend (D_0) and the current

11   market price (P_0) reflect the best estimates of the future of the company at

12   the present time. This also allows for the current dividend (D_0) to be

13   substituted for the next dividend (D_1) when utilizing the DCF model.

14   Since dividends are paid quarterly, the annual DCF model will

15   understate the actual dividend yield if the dividend is increased during any of

16   the four quarters comprising the annual model. Many analysts will use a

17   quarterly DCF model instead of or in addition to the annual model. I have

18   utilized the most liberal form of quarterly model in addition to the annual

19   model. The quarterly model that I utilized, shown below, has dividends

20   increasing quarterly instead of only once during the year. Such quarterly

21   compounding will actually overstate the expected return.

22   $$K_e = [\, d_q(1+g)^{0.25}/P_o + (1+g)^{0.25}\,]^4 - 1$$

23   Where: K_e = return on equity

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1   d_q = current quarterly dividend

2   g = annual growth rate

3   P_o = current market price

4   Exhibit(JES-2) shows the dividend yields for each comparison company

5   based on the June 14, 2001 dividend, the March-May 2001 end-of-month

6   average stock price, and the June 14, 2001 stock price. The average dividend

7   yield based on the March-May 2001 end-of-month average price is 3.49%

8   compared to an average dividend yield of 3.62% when using the June 14,

9   2001 stock price. Dividend yields vary for the individual companies from a low

10 of 2.67% to a high of 4.46%.

11   Exhibit(JES-3) shows projected growth rates for water and wastewater

12 comparison companies. Both dividend growth and earnings growth have been

13 utilized in this analysis. Although the DCF model is predicated on dividend

14 growth, there is disagreement concerning whether dividend growth rates or

15 earnings growth rates are reflective of investor expectations. Over the long

16 term, dividends cannot grow faster than earnings. Thus, earnings growth will

17 place an upper limit on dividend growth in the long run. I have utilized both

18 growth rates in my analysis. The results using dividend growth provide a floor

19 on the return-on-equity expectations while the results using earnings growth

20 produce a ceiling on the return-on-equity expectations.

21   Two public sources of growth forecasts have been utilized. The Value

22 Line Investment Survey is widely distributed and readily available to many

23 investors either by subscription or at libraries. Quicken forecasts are provided

1   by Zacks and are a composite of the forecasts of many analysts. It is available

2   at no cost to anyone having access to the Internet. Growth forecasts published

3   by Zacks can also be found in libraries.

4   Ideally, a very long-term growth is desired as the theoretical DCF

5   model values stock over its lifetime, and utility stocks have historically been

6   considered safe income stocks which investors have tended to hold for long

7   periods. However, investors usually do not have published sources for very

8   long-term forecasts and often buy and sell stocks over a period of a few years.

9   Therefore, it is not unreasonable to expect that investors would rely on five-

10   year growth forecasts when evaluating a stock.

11   It is apparent from the forecasts that the investment community does

12   not expect dividend growth to keep pace with earnings growth. The average

13   dividend growth rate for the comparison companies is 3.0% with a range of

14   1.5% to 4.5%. The average projected earnings growth rates for the

15   comparison companies are 6.9% by Value Line, and 6.6% by Quicken (Zacks)

16   with a range from 6.0% to 9.0%.

17   Exhibit(JES-4) shows the return-on-equity estimates using the annual

18   DCF model, and Exhibit(JES-5) shows the expected return-on-equity using the

19   quarterly DCF model. Based on dividend growth, the expected return-on-

20   equity averages between 6.58% and 6.72% using the annual model and

21   between 6.64% and 6.77% using the quarterly model. Returns-on-equity for

22   the individual companies range from 5.60% to 7.91%. Based on earnings

23   growth, the average expected returns-on-equity range from 10.15% to

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1   10.74% using the annual model and from 10.20% to 10.80% using the

2   quarterly model. For the individual companies the return-on-equity ranges

3   from 10.34% to 12.56%.

4   The return-on-equity estimates derived using dividend growth provide

5   only about a 1 percentage point premium over long-term government bond

6   yields. Since the claims of stock holders are subordinate to the claims of debt

7   holders, the cost of equity must exceed the cost of debt. A 1 percentage point

8   premium for the cost of equity would not be sufficient to attract capital. Thus,

9   the return-on-equity estimates based on dividend growth must be discounted.

10   Returns-on-equity in the 10.15% to 10.80% range derived using earnings

11   growth provide an equity premium in the 5 percentage point range which is

12   more in line with my risk premium analysis discussed later.

13   **Q   Based on the Capital Asset Pricing Model (CAPM), what is your**

14   **estimate of the cost of equity for Utilities, Inc. or CWS?**

15   **A**   The CAPM is a comparable earnings approach where all of the

16   nondiversifiable (systematic) market risk of a firm which impacts the risk

17   premium is determined relative to the entire market through the beta

18   coefficient. It establishes rate of return estimates in conjunction with the risk-

19   return relationship of the entire market. The return estimates derived through

20   the CAPM are equal to the opportunity costs of an investment in a particular

21   firm and, therefore, are the returns investors would expect from investment in

22   a firm of comparable risk.

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1   None of the components of the Capital Asset Pricing Model, shown

2   below, can be observed directly.

3    $$R_e = B(R_m - R_f) + R_f$$

4   Where: R_e = return on equity

5   B = beta coefficient

6   R_m = market rate of return

7   R_f = risk-free rate of return

8   Theoretically, the beta coefficient (B), the market rate of return (R_m), and the

9   risk-free rate of return (R_f) should reflect values expected over the life of the

10   investment. Investors must rely on historical data and their best estimates of

11   future conditions to determine the value of the components of the CAPM.

12   Exhibit(JES-6) shows the betas for the past sixty-month period for the

13   comparison companies as reported by Value Line. Value Line betas are based

14   on the New York Stock Exchange Composite Index and are rounded to 0.00 or

15   0.05. Although these betas are not technically forecasts of future betas, they

16   are related to future expectations. Since investors make decisions based on

17   future expectations, the historical betas reflect the response of the market to

18   the future expectations of the investors during the previous sixty months. The

19   average value of the Value Line betas for the comparison companies is 0.61

20   with a range from 0.60 to 0.65. Given that the market as a whole has a beta

21   of 1.00, the values of the water and wastewater company betas indicate that

22   the nondiversifiable risk faced by these companies is less than that of the

23   market.

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1   Determining the appropriate rate of return for the market may be the

2   most challenging component of the CAPM. According to Ibbotson Associates,

3   in Stocks, Bonds, Bills, and Inflation 2000 Yearbook, the geometric mean total

4   annual return on large company stocks was 11.0% for the 1926-1999 period.

5   The corresponding arithmetic mean return was 13.0%. The Research

6   Department of the Public Service Commission has calculated a 12.4%

7   geometric mean total return for the Standard & Poor's 500 Index for the 30-

8   year period 1970-2000, and a 14.4% arithmetic mean annual return. Over the

9   past 10 years, the growth in the Standard & Poor's 500 index has been

10   substantially higher than in the past. The geometric mean for the 1990-2000

11   period was 15.8% with an arithmetic mean of 17.8%. Because some investors

12   consider the more recent past indicative of the future, it would not be

13   unreasonable for an investor to expect a market return of between

14   approximately 13.0% and 18.0%.

15   U.S. government securities are generally considered to be the best

16   proxy for the risk-free rate of return. Given the taxing power of the Federal

17   government, there is minimal risk of default on these securities. Many U.S.

18   government securities are subject to inflation risk. However, the Federal

19   government does offer inflation-adjusted long-term savings bonds.

20   Exhibit(JES-7) shows the yields on U.S. government securities as of June 14,

21   2001 and an end-of-month average for the March-May 2001 period.

22   Historically, the 30-year Treasury Bond was considered the benchmark. The

23   federal government's aggressive effort to shrink its long-term debt in 2000

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1   reduced the supply of 30-year bonds available, and the 10-year Treasury Bond

2   has replaced the 30-year bond as the benchmark. Yields on Treasury Bonds

3   have generally been increasing as the Federal Reserve has lowered the

4   discount rate in an attempt to stimulate the economy. Federal Reserve

5   Chairman Greenspan has indicated that more reductions in the discount rate

6   are likely. I would expect the yields on the Treasury Bonds to rise in the future

7   in response to further lowering of the discount rate. Thus, I have used the

8   March-May 2001 end-of-month average yield of 5.67% on 30-year Treasury

9   Bonds in my CAPM analysis since this more closely reflects what I expect for

10   the risk-free rate.

11   Exhibit(JES-8) shows the results of the CAPM analysis using the low

12   and high values of the expected range of market returns. At a market return

13   of 13.0%, the average expected return-on-equity for the comparison

14   companies is 10.16%. For the individual companies, the range is from 9.70%

15   to 10.43%. At a market return of 18.0% the expected average return-on-

16   equity is 13.22%. Expected returns-on-equity for the individual companies

17   range from 12.45% to 13.68%. Based on the CAPM, the cost of equity would

18   fall in the range of 10.16% to 13.22%.

19   **Q   Based on the Risk Premium analysis, what is your estimate of the**

20   **cost of equity for Utilities, Inc. or CWS?**

21   **A**   The Risk Premium model is based on the theory that common

22   stockholders require a premium above the cost of debt to compensate them

23   for the added risk of being subordinate to debt holders on claims on a

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1   companies earnings or assets. I have determined the risk premium based on

2   the yields on long-term government bonds. These yields are easily available to

3   the public.

4   Exhibit(JES-9) shows the risk premiums using 1926-1999 market

5   returns and long-term government bond yields as reported by Ibbotson

6   Associates in Stocks, Bonds, Bills, and Inflation 2000 Yearbook and 1970-2000

7   market returns of the S & P 500 Index and long-term government bond yields

8   as calculated by the Research Department from Standard & Poor's Statistical

9   Service. The equity risk premiums based on the total return on large company

10   stocks reported by Ibbotson and the total returns on S & P 500 Index as

11   calculated by the Research Department must be adjusted to reflect the fact

12   that the water and wastewater companies have less risk than the market. I

13   used the average beta of the water and wastewater companies to make this

14   adjustment. No adjustment was made to the equity premium based on the S &

15   P Utility Index since this index represents the return on utility stocks. However,

16   this premium probably overstates the actual risk premium applicable to water

17   and wastewater companies because the water companies tend to have lower

18   betas than telecommunications companies, or gas companies, and only slightly

19   higher betas than electric companies. The utility risk premiums range from

20   3.43% to 5.77% and average 4.59%. Adding the risk premiums to the March-

21   May 2001 average yield of 5.67% on long-term government bonds produces a

22   cost of equity ranging from 9.10% to 11.44% with an average of 10.26%. The

1   cost of equity determined by the risk premium analysis is consistent with the

2   cost of equity determined by the DCF and CAPM analyses.

3 **Q   Can or should the fairly wide ranges in the estimated cost of equity**

4   **be narrowed?**

5 **A**   If the estimates of cost of equity are to be useful for making decisions,

6   I believe that the ranges should be narrowed as much as possible.

7   Unfortunately, narrowing the range of estimates becomes largely subjective,

8   and depends on the analyst's interpretation of the impact of many factors on

9   the cost of capital. The following table shows the return-on-equity ranges

10   produced by the DCF, CAPM, and Risk Premium analyses:

Method	Return-on-equity (%)
DCF	10.15 – 10.80
CAPM	10.16 – 13.22
Risk Premium	9.10 – 11.44

15   Note that I have excluded the expected returns-on-equity generated by the

16   DCF analysis based on dividend growth because these returns did not provide

17   a sufficient premium over the cost of debt.

18   The DCF and CAPM expected returns-on-equity overlap between

19   10.16% and 10.80%. Overlap occurs in the DCF and Risk Premium analyses

20   between 10.15% and 10.80%. The CAPM and Risk Premium analyses overlap

21   between 10.16% and 11.44%. Each methodology generates an expected

22   return-on-equity of up to 10.80%. Two of the methodologies produce an

23   expected return-on-equity of up to 11.44%. Based on the consistencies of the

1   methodologies, I would be confident that the return-on-equity for the water

2   and wastewater industry would be in the general range of approximately

3   10.00% to 11.50%.

4   Determining the return-on-equity applicable to Utilities, Inc. or CWS

5   becomes more subjective. Utilities, Inc. and CWS are much smaller than the

6   comparison water and wastewater companies. Based on net plant, the

7   smallest comparison company is nearly 50% larger than Utilities, Inc. and

8   about 18 times larger than Carolina Water Service. Generally, smaller

9   companies are considered to have more risk than larger companies. This

10   higher risk is attributable to a smaller company's limited access to financial

11   resources should its financial position deteriorate. Also, the loss of a customer,

12   particularly a large customer, may have a greater negative impact on a smaller

13   company than a larger company. CWS depends on its parent, Utilities, Inc., for

14   its external financing. As a regulated utility, CWS applies to the Public Service

15   Commission for rate relief when CWS determines that revenues are

16   insufficient. Also, since the customers of CWS are either residential customers

17   or small commercial customers, the negative impact of losing a customer is

18   fairly small.

19   Therefore, I believe that the risk of CWS would be viewed by an

20   investor as the risk of its parent, Utilities, Inc. With most of its revenues

21   derived from regulated operations, Utilities, Inc. should have a risk similar to

22   that of other regulated water and wastewater companies regardless of size.

23   The regulatory climate in its operating states would be as important of a risk

1   factor as size. I have no knowledge that the regulatory climate in the states

2   where Utilities, Inc. has operating subsidiaries is any better or worse than the

3   regulatory climate in the states where the comparison companies operate.

4   However, because size can impact risk, I consider the upper end of my

5   narrowed range more appropriate. Thus, a return-on-equity or cost of equity

6   of 10.50% to 11.50% would be appropriate.

7 **Q**   **What did you determine was the appropriate cost of debt?**

8 **A**   In its application, CWS proposed a cost of debt of 8.62% which is the

9   cost of debt for Utilities, Inc. The Audit Department has verified this number.

10   Because Utilities, Inc. provides all external financing for CWS, the cost of debt

11   for Utilities, Inc. is appropriate. I use this 8.62% in calculating the cost of

12   capital.

13 **Q**   **What is the appropriate capital structure?**

14 **A**   CWS has proposed using the capital structure of its parent, Utilities,

15   Inc. Because Utilities, Inc. for all practical purposes determines the capital

16   structure of CWS, it is appropriate to use the capital structure of Utilities, Inc.,

17   unless it deviates substantially from the industry capital structure. Exhibit(JES-

18   10) shows that actual capital structure of the comparison companies and their

19   projected capital structures. The average capital structure on December 31,

20   2000 for the group was 51.3% long-term debt and 48.0% common equity.

21   The average projected capital structure consists of 53.3% long-term debt and

22   46.5% common equity. On December 31, 2000 the capital structure of

23   Utilities, Inc. was 49.9% long-term debt and 50.1% common equity. The

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1   capital structure of Utilities, Inc. does not differ substantially from that of the

2   comparison companies. I use the capital structure of Utilities, Inc. in my

3   calculation of the cost of capital.

4   **Q. What did you determine was the appropriate cost of capital for CWS?**

5   **A**   As shown in Exhibit(JES-11), the appropriate cost of capital for CWS is

6   in the range of 9.56% to 10.06%.

7   **Q   Does this conclude your testimony?**

8   **A**   Yes.

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CAROLINA WATER SERVICE, INC.
Docket No. 2000-0207-W/S

EXHIBITS
OF
JAMES E. SPEARMAN

RESEARCH DEPARTMENT

PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA

JUNE 27, 2001

WATER AND WASTEWATER INDUSTRY
2000 OPERATING AND FINANCIAL DATA

Company	S&P Stock Rating	Return on equity (%)	Operating Revenues ($ million)	Net Income ($ million)	Net Utility Plant ($ million)	Earnings Per Share ($)	Dividends Per Share ($)	Dividend Payout Ratio (%)	Customers
American States Water Co.	B+	10.5	184.0	18.1	509.1	1.92	1.29	67.2	NA
American Water Works Co.	A	9.4	1,350.6	157.4	5,202.8	1.61	0.90	55.9	2,580,968
California Water Service Group	B+	10.1	244.8	20.0	582.0	1.31	1.10	84.0	544,200
Philadelphia Suburban Corp.	A-	11.7	275.5	52.9	1,251.4	1.01	0.62	61.4	579,219
Average		10.4	513.7	62.1	1,886.3	1.46	0.98	67.1	1,234,796
Utilities, Inc.		14.4	64.7	10.1	351.8	1.58	0.00	0.0	235,000
Carolina Water Services		2.8	4.9	0.3	27.9	NA	0.00	0.0	17,304

Sources: Company Annual Reports, SEC Form 10K, and Reports of Independent Public Accountants
Carolina Water Service, Inc. Application and responses to data requests and interrogatories
Value Line Investment Survey, May 4, 2001
Standard & Poor's Stock Guide, June 2001

**WATER AND WASTEWATER COMPANIES
DIVIDEND YIELDS**

Company	Mar.-May. 2001 end-of-month average stock price	June 14, 2001 stock price	June 14, 2001 dividend	Mar.-May. 2001 end-of-month average dividend yield	June 14, 2001 dividend yield
American States Water Co.	$32.14	$31.79	$1.30	4.04%	4.09%
American Water Works Co.	$31.32	$29.12	$0.94	3.00%	3.23%
California Water Service Group	$26.39	$25.10	$1.12	4.24%	4.46%
Philadelphia Suburban Corp.	$23.23	$22.91	$0.62	2.67%	2.71%
Average	$28.27	$27.23	$1.00	3.49%	3.62%

Source: The Wall Street Journal

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WATER AND WASTEWATER INDUSTRY
PROJECTED GROWTH RATES

Company	5-Year Projected Dividend Growth (%) Value Line	5-Year Projected Earnings Growth (%) Value Line	Quicken (Zacks)
American States Water Co.	1.5	6.0	NA
American Water Works Co.	4.5	9.0	6.2
California Water Service Group	1.5	6.0	6.0
Philadelphia Suburban Corp.	4.5	6.5	7.7
Average	3.0	6.9	6.6

Sources: Value Line Investment Survey, May 4, 2001
Average growth rate of analysts as of June 14 reported by Quicken

WATER AND WASTEWATER INDUSTRY
ANNUAL DISCOUNTED CASH FLOW MODEL RETURN-ON-EQUITY

COMPANY	Mar.-May 2001 Dividend Yield (%)	June 14, 2001 Dividend Yield (%)	Value Line DPS Growth (%)	Mar.-May 2001 Annual DCF Model ROE (%)	June 14, 2001 Annual DCF Model ROE (%)
American States Water Co.	4.04	4.09	1.5	5.60	5.65
American Water Works Co.	3.00	3.23	4.5	7.64	7.88
California Water Service Group	4.24	4.46	1.5	5.80	6.03
Philadelphia Suburban Corp.	2.67	2.71	4.5	7.29	7.33
Average	3.49	3.62	3.0	6.58	6.72

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WATER AND WASTEWATER INDUSTRY
ANNUAL DISCOUNTED CASH FLOW MODEL RETURN-ON-EQUITY

COMPANY	Mar.-May 2001 Dividend Yield (%)	June 14, 2001 Dividend Yield (%)	Value Line EPS Growth (%)	Mar.-May 2001 Annual DCF Model ROE (%)	June 14, 2001 Annual DCF Model ROE (%)	Quicken (Zacks) EPS Growth (%)	Mar.-May 2001 Annual DCF Model ROE (%)	June 14, 2001 Annual DCF Model ROE (%)
American States Water Co.	4.04	4.09	6.0	10.28	10.34	NA	NA	NA
American Water Works Co.	3.00	3.23	9.0	12.27	12.52	6.2	9.39	9.63
California Water Service Group	4.24	4.46	6.0	10.49	10.73	6.0	10.49	10.73
Philadelphia Suburban Corp.	2.67	2.71	6.5	9.34	9.39	7.7	10.58	10.62
Average	3.49	3.62	6.9	10.60	10.74	6.6	10.15	10.33

WATER AND WASTEWATER COMPANIES
QUARTERLY DISCOUNTED CASH FLOW MODEL RETURN-ON-EQUITY

Company	Dividend Per Share Growth Value Line (%)	Earnings Per Share Growth	
		Value Line (%)	Quicken (Zacks) (%)
American States Water Co.	5.67	10.35	NA
American Water Works Co.	7.67	12.31	9.42
California Water Service Group	5.88	10.57	10.57
Philadelphia Suburban Corp.	7.32	9.37	10.60
Average	6.64	10.65	10.20

Note: market price = average end-of-month price for March-May 2001

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WATER AND WASTEWATER COMPANIES
QUARTERLY DISCOUNTED CASH FLOW MODEL RETURN-ON-EQUITY

Company	Dividend Per Share Growth Value Line (%)	Earnings Per Share Growth	
		Value Line (%)	Quicken (Zacks) (%)
American States Water Co.	5.71	10.40	NA
American Water Works Co.	7.91	12.56	9.67
California Water Service Group	6.11	10.81	10.81
Philadelphia Suburban Corp.	7.36	9.41	10.64
Average	6.77	10.80	10.37

Note: market price = June 14, 2001 closing price

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WATER AND WASTEWATER INDUSTRY
BETAS

Company	Value Line beta
American States Water Company	0.65
American Water Works Company	0.55
California Water Service Group	0.65
Philadelphia Suburban Corporation	0.60
Average	0.61

Source: Value Line Investment Survey, May 4, 2001

U.S. GOVERNMENT SECURITY YIELDS

Term	Security	Mar.-May 2001 End-of-Month Average Yield	June 14, 2001 Yield
10-Year	Treasury Bond	5.22%	5.23%
30-Year	Treasury Bond	5.67%	5.65%

Source: The Wall Street Journal

WATER AND WASTEWATER INDUSTRY
CAPITAL ASSET PRICING MODEL RETURN-ON-EQUITY

Company	Value Line Beta (B)	Market Rate of Return (Rm)	Risk-Free Rate of Return (Rf)	Expected Return on Equity (%)
American States Water Co.	0.65	13.0	5.67	10.43
American Water Works Co.	0.55	13.0	5.67	9.70
California Water Service Group	0.65	13.0	5.67	10.43
Philadelphia Suburban Corp.	0.60	13.0	5.67	10.07
Average	0.61	13.0	5.67	10.16

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WATER AND WASTEWATER INDUSTRY
CAPITAL ASSET PRICING MODEL RETURN-ON-EQUITY

Company	Value Line Beta (B)	Market Rate of Return (Rm)	Risk-Free Rate of Return (Rf)	Expected Return on Equity (%)
American States Water Co.	0.65	18.0	5.22	13.53
American Water Works Co.	0.55	18.0	5.22	12.25
California Water Service Group	0.65	18.0	5.22	13.53
Philadelphia Suburban Corp.	0.60	18.0	5.22	12.89
Average	0.61	18.0	5.22	13.05

EQUITY RISK PREMIUM

	Ibbotson Associates (1926 - 1999)		Research Department (1970 - 2000)		Research Department (1970 - 2000)
Total return on large company stocks	13.00%	Average return on S&P 500 Index	14.35%	Average return on S&P Utility Index	14.49%
Long-term government bond yield	5.50%	Long-term government bond yield	8.72%	Long-term government bond yield	8.72%
Equity risk premium	7.50%	Equity risk premium	5.63%	Equity risk premium	5.77%
Utility adjustment (beta)	0.61	Utility adjustment (beta)	0.61	Utility adjustment (beta)	NA
Utility equity premium	4.58%	Utility equity premium	3.43%	Utility equity premium	5.77%

Sources: Ibbotson Associates, Stocks, Bonds, Bills, and Inflation 2000 Yearbook
Standard & Poor's, Statistical Service

WATER AND WASTEWATER INDUSTRY
CAPITAL STRUCTURE

Company	Actual 12/31/00			Projected 2004-2006		
	Long-term debt (%)	Preferred stock (%)	Common equity (%)	Long-term debt (%)	Preferred stock (%)	Common equity (%)
American States Water Co.	47.6	0.5	51.9	48.0	0.0	52.0
American Water Works Co.	56.9	1.3	41.8	57.0	1.0	42.0
California Water Service Group	48.0	0.9	51.1	54.5	0.0	45.5
Philadelphia Suburban Corp.	52.8	0.2	47.0	53.5	0.0	46.5
Average	51.3	0.7	48.0	53.3	0.2	46.5
Utilities, Inc.	49.9	0.0	50.1	NA	NA	NA

Sources: Company Annual Reports
Carolina Water Service, Inc. application
Value Line Investment Survey, May 4, 2001

COST OF CAPITAL

Long-term Debt (%)	Cost of Debt (%)	Common Equity (%)	Cost of Equity (%)	Cost of Capital (%)
49.91	8.62	50.09	10.50	9.56
49.91	8.62	50.09	11.50	10.06